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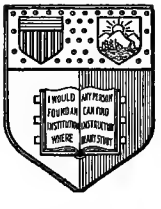

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CORRELATION OF DEGREE OF MATURITY WITH STANDINGS IN CERTAIN MENTAL TESTS AND SCHOOL GRADES

By
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A Thesis

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PREFACE

In the psychological literature dealing with childhood and youth the statement is frequently made that mental development is so related to physiological development that there are different degrees of mental maturity depending upon degrees of physiological maturity. But there are as yet few exact determinations of this relationship. Probably no one doubts that there is some such connection.

Gilbert (1)* made extensive tests upon children of different ages and thought he found the older children doing markedly better in his tests. However, his study on careful analysis, does not show much striking difference between the younger and the older children.

In the study of the influence of maturity upon mental ability, it has seemed to some recent investigators that sexual maturation in the early teens has marked bearings on mental changes. Among these recent investigators, Dr. C. Ward Crampton, Director of Physical Education of New York City Public Schools, and Prof. Bird T. Baldwin of Swarthmore College, may be mentioned.

Crampton (2) has attempted to trace,—in boys,—the relations between school progress—failures and eliminations—and the respective degrees of physical maturity, which, to use his terms, are prepubescence, pubescence, and postpubescence.

Baldwin (3) secured various measurements upon 1924 children through a number of years, and on the basis of his study, traces a number of relations which he believes to hold between physical development and school work.

In the studies of both Crampton and Baldwin, however, the correlation was made between degree of maturity and school grades. Therefore it was suggested by

* The numbers after the proper names refer to corresponding numbers in the bibliography.

Doctor Irving King, of the College of Education, State University of Iowa, that a study should be made from data based on mental tests other than that of school work, and further, that such a study should yield results that would be of material advantage in dealing with such a complex situation as that of educating growing boys and girls.

At the suggestion of Doctor King and under his direction, the writer undertook the study of the correlation of degree of maturity with standings in certain mental tests; and, to check with what others had done in this field, school grades were also studied and correlated.

The writer feels that he is under obligations to Doctor King for giving him the problem and for his many helpful suggestions and kindly, constructive criticisms in the preparation of this thesis.

Thanks are due to Superintendent L. F. Meade and Superintendent of Grades, P. C. Packer, of the Iowa City Schools, for their kindness in permitting the tests to be given in their schools, and to the two physical training directors of the Public Schools of Iowa City, Mr. Souchek and Miss McCreadie, who furnished the records of physical development which were here used. Indeed, without their co-operation, these tests could not have been made.

OUTLINE

Correlation of Degree of Maturity With Standings in Certain Mental Tests and School Grades.

I. The Problem and Its Importance.

II. Method of the Investigation.
   1. Determination of physical development.
   2. Abilities tested.
   3. Tests used.
   4. Method of giving the tests.
      a. Order of giving the tests.
      b. Instructions.
      c. Instructions given in each variety of test.

III. Scoring of Results.
   1. General principles.
   2. Method of scoring for each test.
   3. Tables and analyses.

IV. Comparison of School Grades With Chronological Age and Physiological Age.

V. The Burlington and Sheldon Material.

VI. General Conclusions.

CORRELATION OF DEGREE OF MATURITY WITH STANDINGS IN CERTAIN MENTAL TESTS AND SCHOOL GRADES

I. The Problem and Its Importance.

For the purpose of this study, maturity is taken to mean physiological maturity, as shown by evidence of sex development.

The problem was to determine as far as possible, through the data available, whether there is, as assumed by previous investigators, a sufficient amount of mental difference between the prepubescents and the pubescents and between these and the postpubescents, to warrant a classification of school children based wholly, or in part, upon physiological age, i. e. upon degree of physiological maturity, rather than upon chronological age. The only published account of such a classification according to degree of physiological development is that of Foster in The Psychological Clinic, Vol. IV., page 83, Physiological Age as a basis for Classification of pupils entering High Schools.

The work that is interesting and highly profitable in its returns to the prepubescent no longer awakens the right response in the pubescent. Still there is, as yet, no differentiation in courses of study, based on the maturity of those for whom these courses of study are supposed to furnish a large share of the means for the right building up of a strong, healthy-minded man or woman. Courses of study are administered wholly on the theory that those who can do the work, as presented, will of necessity be benefited by such work, and that such work must, therefore, be the proper activity just because it can be done with a minimum of friction. This view, however, leaves out of account the possible differences in mental need in various pupils, that may be due to different degrees of maturity existing among them.

Our problem may be further defined through the following statements and conclusions of Dr. Crampton, based on his extended studies of New York High School boys.

"The term physiological age refers to the stage of development in contradistinction to age in years and months, which is the usual method of designating age."

"There are various evidences of physiological age: Tooth appearance, pubescence, change of voice, menstruation, menopause, etc."

"Pubescence is an evidence of sexual ripening and marks the beginning of adolescence. Pubescence in the male, is the feature studied in this work. There are three groups, distinguished as follows: (1) Prepubescence; (2) pubescence; (3) postpubescence."

"In the groups studied, each physiological age group contains individuals who vary much among themselves as to their real physiological age."

"The prepubescents are 55 per cent of the total number at 13.25 years. Some of these, 14 per cent of all that age, will become pubescent within a half year; others, 1 per cent of all, will not become pubescent until 16.75 years of age. This 1 per cent is, therefore, 3 years younger physiologically than the 14 per cent."

"Similarly, the postpubescent groups vary as to the number of years elapsed since they have passed through their pubescence."

"American born children of German born parents appear to be later in attaining pubescence than American born children of American born parents."

"Weight and Pubescence.—Postpubescents average 24 per cent to 33 per cent heavier than prepubescents of the same chronological age."

"Height and Pubescence—Postpubescents average as much as 11 per cent taller than prepubescents of the same chronological age."

"Strength and Pubescence.—The postpubescents av-

eraged 33 per cent stronger than the prepubescents."

"Pubescence and Scholarship.—Success in school should not be taken to imply success in other lines."

"The higher the grade the fewer the prepubescents, age for age, hence, postpubescents are better in scholarship than prepubescents, and the more advanced a group in pubescence the better will be the scholarship."

"Scholarship and Pubescence.—We can determine what influence physiological age may have on success in scholarship by observing the rate of success and failure of each chronological age and physiological age group. Postpubescents are thus found to be more successful, eighteen per cent failing to pass into the next term as against twenty-seven per cent of failure for the prepubescents, at thirteen years of age. At fourteen years the percentages of failure are twenty-four and thirty-four respectively; at fifteen years, twenty-nine and thirty-six. (These figures are taken from first year students in a High School.)"

"Conclusions.—Earlier pubescence favors good scholarship; later pubescence, poorer scholarship. This should be taken into consideration by all those who have the care of the pubescent." (Crampton in The Influence of Physiological Age Upon Scholarship, The Psychological Clinic, Vol. I.)

Boas, (4) in the Cyclopedia of Education, seems to have the same opinion where he says:

"Through the investigations of Porter and Crampton it has been shown that retardation of physical development is closely associated with retardation of progress in school. To the same causes which keep back the physical development of the child must be partly due its late entrance upon school life and its slow promotions. Children who are older than the average age of their grade are therefore, on the whole, physiologically retarded children; and those who are younger are, on the whole, children accelerated in physiological development. These observa-

tions make it plausible that the assumption which has been made so frequently—that a period of slow development of the body is correlated with a period of rapid development of mental faculties, and vice versa—is not correct, but rather that rapid physical and mental development go hand in hand. If during the period of rapid growth the child has to be guarded against overtaxation, both mental and bodily functions are equally concerned. The close correlation between the two emphasizes the need of proper care of body and mind." (Boas, Article on "Growth," Cyclopedia of Education.)

"General Conclusions.—In future all of our thought concerning the years nine to seventeen must be released from the idea of chronological age. Statistics for groups or individuals respecting, weight, height, strength, scholarship, mental or physical endurance, medical or social conditions, that are not referred to physiological age are inconsequential and misleading." (Crampton in The Influence of Physiological Age Upon Scholarship, The Psychological Clinic, Vol. I.)

With grammar grade pupils the reverse seems to be true. The more mature do not show up as well as the immature.

With reference to a particular experiment in classification in an elementary school, according physiological age Crampton says:

"The separation of the mature group made perfectly clear that this group was different, and, in the main, less successful in their studies than the immature. They are, in general, the slow students, or they would have completed the school course long before. One teacher states: 'They were 40 per cent slower, and intellectually clumsy.' There is general agreement among all teachers that the big boys are doing better by themselves, because they are free from the irritating superiority of the smaller boys, whose success was likely to be held up to them as a pat-

tern and example. They feel more at home, and work with a much better spirit, and will plod energetically along in a task that is given them." (Crampton in "The Significance of Physiological Age.")

II. Method of the Investigation

The writer, personally, gave the tests to certain pupils in the Iowa City schools. The grades of these pupils are shown in the "Grade Distribution Table." (No. II.)

1. Determination of physiological divisions.

The signs of puberty and full maturity were determined by the physical directors of the Iowa City schools. The items used in this determination by these physical directors are the same as those given by Crampton in his article entitled "Physiological Age—A Fundamental Principle." *

We can best state these items in his own words:

" 'Pubescence' from the inchoative pubesco, ere, ivi again denotes a process covering a period of time, the completion of which is often vaguely understood to be puberty. This is a term which is often loosely used to denote puberty or adolescence. It should be used to mean the process of becoming covered with hair, and unless qualified should have reference to the pubic pubescence alone. A pubescent is an individual who is undergoing this process and is in the period of pubescence. The period of prepubescence begins at birth and ends at the beginning of pubescence and all in this period are prepubescents. All those who have completed their pubescence are postpubescents. The transition from the prepubescent stage to the pubescent stage is gradual. It, pubescence, is begun by an evident and rapid growth of fine hair apparently already present. This is readily distinguishable, and this characteristic marks the first part of the period of pubescence; the second period of pu-

* The American Physical Education Review, March, April and June, 1908, Vol. XIII., Nos. 3-6.

bescence arbitrarily ends with the appearance of the kink or twist which is definitely characteristic."

We must not assume that these signs indicate the first beginnings of sex development for as Thorndike pointedly says: "The one instinct whose appearance seems most like a dramatic rushing upon life's stage—the sex instinct—is found upon careful study to be gradually maturing for years." (Thorndike's Educational Psychology, Briefer Course, page 107.)

The writer was able to secure records of degree of maturity of 120 pupils in the Iowa City grammar and High School. These records were obtained during the winter of 1915-16. The intellectual tests were given to 138 pupils, but owing to the absence of the maturity records, eighteen had to be rejected.

The following tables show the distribution of these pupils by sex, age and grade.

TABLE I.

Age Distribution.
Maturity and Sex

Maturity	Prepubes't		Pubescent		Postpubes't	
	Boys	Girls	Boys	Girls	Boys	Girls
Years						
10.5 --|-- — 11.0	1					
11 --|-- — 11.5	3	1				
11.5 --|-- — 12.0	3			1		
12 --|-- — 12.5	3	5	1	1		
12.5 --|-- — 13.0	4	3	4	1	2	1
13 --|-- — 13.5	9	5		3		4
13.5 --|-- — 14.0	5	2	2	1	7	2
14.0 --|-- — 14.5		2		3	7	1
14.5 --|-- — 15.0	3		2		4	4
15 --|-- — 15.5	1	2	1	1	3	2
15.5 --|-- — 16.0				1	2	1
16 --|-- — 16.5	1				1	1
16.5 --|-- — 17.0		1				
17 --|-- — 17.5						
17.5 --|-- — 18.0						
18 --|-- — 18.5					1	
18.5 --|-- — 19.0						
19 --|-- — 19.5					1	
No. of cases.....	33	21	10	12	28	16
Median age.....	13.2 —	13.2	13.3--|--	13.7 —	14.2--|--	14.3--|--

--|-- means Plus.

TABLE II.

Grade Distribution

Maturity	Prepubes't		Pubescent		Postpubes't	
	Boys	Girls	Boys	Girls	Boys	Girls
Grade						
7 B	1					
7 A	7	1			2	
8 B	21	13	7	7	14	12
8 A	3	5	3	5	12	4
9 B	1	2				
Totals	33	21	10	12	28	16

2. Abilities tested.

As stated before it was the object of this investigation to obtain some measurements of the ability of those pupils, other than those furnished by school grades. To do this the following plan was used to test as many different abilities as possible with the limited number of tests that could be given in the time available.

These tests may be classified under four headings, namely, a test of simple association, of memory for ideas, of muscular control, and of selective judgment. While there is naturally an overlapping of abilities tested, still each test is a test of a somewhat specific ability.

It would have been very desirable to have used a number of different tests, but it was not possible to do so within the conditions under which the work had to be done.

3. Tests used.

There were in all six tests given, in the order which follows:

Addition Examples

(Simple Association Test)

17	26	27	72	23
42	51	24	13	47
38	47	83	39	86
91	82	19	81	54
54	63	45	26	36
—	—	—	—	—

17	42	38	91	36
26	51	47	82	26
27	24	83	19	45
72	14	39	62	63
23	47	86	54	54
—	—	—	—	—

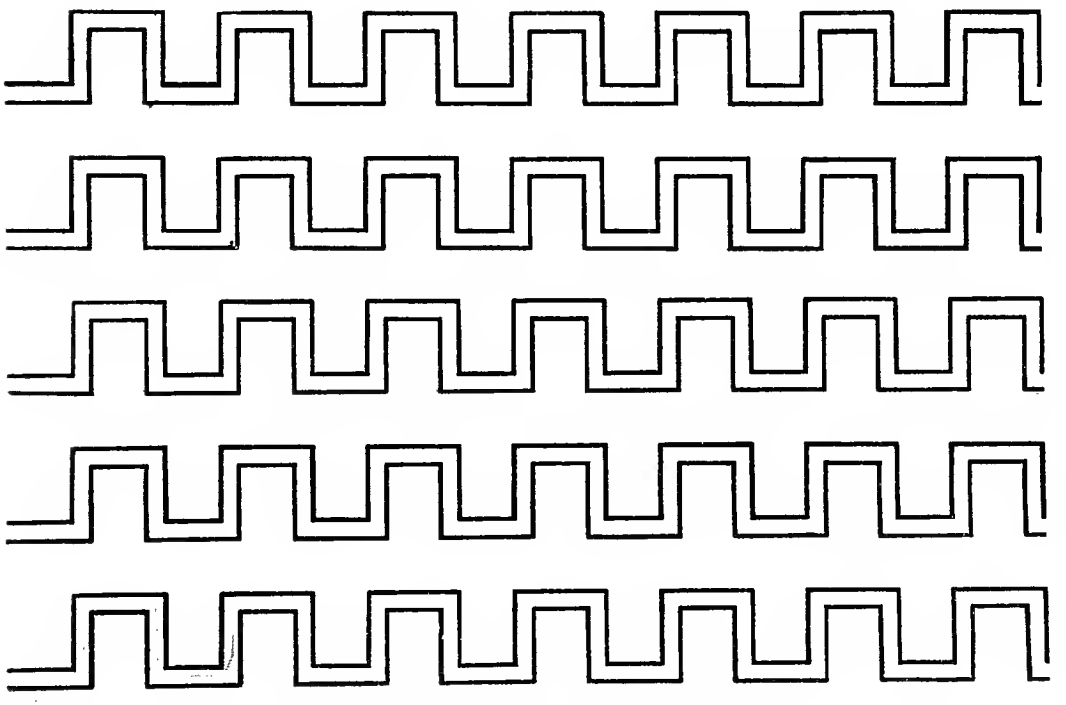
The Marble Statue.

(Memory for Ideas Test)

A young man worked years to carve a white marble statue of a beautiful girl. She grew prettier day by day. He began to love the statue so well that one day he said to it: "I would give everything in the world if you would be alive and be my wife." Just then the clock struck twelve, and the cold stone began to grow warm, the cheeks red, the hair brown, the lips to move. She stepped down, and he had his wish. They lived happily together for years, and three beautiful children were born.

Adopted from Whipple's Manual of Mental and Physical Tests, page 397.

The muscular co-ordination test was the first three "lanes" from the Lanes Test, devised by the Columbia University Psychological Laboratory. A sample of this tests follows:



The tests in reasoning, selective judgment, were forms "A," "B" and "D" of Test V, used by Simpson in his study of "Correlation of Mental Abilities," pages 99 and 100.

A. The following reasons have been given to show why New York has become a larger city than Boston. As quickly as you can, place a check mark before each reason you think a good one:

1. New York is on an island.
2. More foreigners live in New York than in Boston.
3. New York is on a large river coming from a rich agricultural region.
4. Mr. Rockefeller has a fine home in New York.
5. New York has more churches than Boston.
6. New York has better communication with the states lying to the west.
7. New York has elevated railroads.
8. New York is in the midst of a rich fruit and agricultural district.
9. New York is nine or ten years older than Boston.
10. New York has a republican governor.

B. These reasons have been given to show that oak is better than pine for making furniture. Check the good reasons.

1. Oak wood is harder than pine.
2. Oak trees have acorns, pine trees do not.
3. Oak wood takes a finer polish than pine.
4. Oak trees have more beautiful leaves.
5. Oak trees make good homes for squirrels.
6. Pine wood will not last so long as oak.
7. Pine is more easily dented and defaced than oak.
8. When polished and varnished, oak is much more beautiful than pine.

9. Pine trees are sometimes used for Christmas trees.

10. Oak trees are easier to climb than pine trees.

D. Among these reasons why horses are better than cattle for driving and working animals, check those which you think are good reasons.

1. Horses are more intelligent than cattle.

2. Cattle are not so tall as horses.

3. Horses like corn, oats and hay.

4. Horses are much more active and walk faster than cattle.

5. Cattle are extensively used for food.

6. Horses are much more beautiful and graceful than cattle.

7. The skins of horses are sometimes made into gloves.

8. Horses are more easily trained and controlled than cattle.

9. President Roosevelt likes to ride on horseback.

10. Horses have more rapid and varied gaits than cattle.

4. Method of Giving the Tests.

The tests were given to small groups of pupils by the writer who regarded two points:

(a) The same order was followed for all pupils, and conditions as nearly the same as the comfort of pupils and freedom from interruption and the like would permit were maintained.

(b) The instructions given for every test were intended to be so full and complete that there could be no mistake as to what was to be done in the test at hand.

(c) Instructions given in each test.

The instructions given in the "Addition Test" were as follows, though there was more or less of a deviation from this form if it was apparent that the pupils did not understand what they were expected to do: "In this test

you will be given slips of paper with problems in addition on one side. The slips will be passed out with the blank side up. You are to write your name and the date of the test on the blank side. Then at the signal, 'Start,' you are to turn the slip over and add the examples as accurately and as quickly as you can. Look up as soon as you have finished the examples that I may give you the time. Record this time on the back of the slip. If you are through at the time that I am giving to some one else, take that time as yours and write it on the back of your slip. This is not a competitive test, each one is timed separately." "Do you understand what is to be done? Start." The stop-watch was snapped at the word "Start," so the time given to each pupil would include the time occupied in turning the paper over and adjusting it to the position needed for adding, as well as the time taken for completing the work of addition.

The instructions in the memory test were, in general, as follows: "Write your name and the date at the top of the sheet of paper that I have given you. Write the name of the selection, 'The Marble Statue,' that I am going to read to you. I shall read for you some ten lines of this piece, and you are to reproduce the selection just as I read it to you. If you reproduce all, that would make your paper 100 per cent perfect. If you are not able to reproduce the selection as I read it, give as much as you can, give the ideas that it expresses, the same as you would in reproducing story in your language work in school. You are to write nothing of the selection till I have finished reading and told you, 'Begin to write.'" "Do you understand? You will not be timed in this test." The selection was then read and the pupils were given all the time needed to complete the reproduction.

In the case of "Lanes Test," this in general was the manner of giving it. The pupils were shown a sample of the "lanes," and told that the work called for was to trace

a pencil mark, that is draw a pencil mark through the first three lanes from the top, running into the boundary lines, the fences, as few times as possible. "Do this as quickly as you can, for you are timed in this test. You are to write your name and the date on the blank side of the paper, then at the signal, 'Start,' you are to turn the paper over and draw the pencil mark through the lanes as I have told you to draw it. Do you understand what is to be done?" If the pupils said they understood what was to be done, the test began. The same thing may be said as to the conciseness of all the directions given in these tests. The writer is of the opinion that these tests were not intended to test the ability of the pupils to follow a fixed set of directions, but rather to do specific things resident in the tests themselves, hence the directions were varied to suit the pupils being tested. But in no case did these variations amount to helping the pupils with the tests, for all instructions were given before the tests were started.

The directions printed at the top of each of the slips containing the reasoning test were supplemented by the following or more if found necessary: "You will find the directions for doing the work of this test printed at the top of the slip. Follow these directions exactly. When you check a sentence that you think is a good reason, put your pencil on the number of the sentence and check the number so that I may know just which of the sentences you consider good reasons. Write your name and the date on the back of the slip, and at the signal, 'Start,' turn the slip over, read the directions at the top and check as the directions tell you. Do you understand what is to be done? You are timed in this test." While the time was not taken into account in scoring this test, still it was thought that the time element might be of value in future investigations.

III. Scoring of Results

1. General principles.

Any scheme of scoring the results of tests of the nature of those given would of necessity be more or less arbitrary, but in every case in devising the method of scoring that method was finally adopted which seemed to be most fair to the ability tested. The plan thought best was to make the final score a function of the time taken to complete each test.

2. Method of scoring for each test.

The final score in the addition test was obtained by adding to the time taken by pupil to finish the adding, a penalty of .05 of this time for each mistake. (Two mistakes to each problem were recognized, since each problem consisted of two columns.) The final score is given in seconds, and the less the number of seconds the better the score.

This plan of scoring is to the advantage of the rapid worker.

The plan of scoring the memory test is that of Whipple—Manual of Mental and Physical Tests, page 397—for the same test. The final score was the number of ideas reproduced. There are thirty-seven ideas in the part used by the writer, hence a perfect score in this test is 37.

In the "Lanes Test" the final score was determined as follows: The time taken to trace the lanes, the first three, was reduced to seconds, and to this was added a penalty of 1-10 of the time for one or two contacts 2-10 for three or four, 3-10 for five or six and so on, thus making the final score a function of the time taken to trace the lanes. The lower the number of seconds, the higher the ability tested.

The scoring used in the reasoning tests is that found in Bonser's **The Reasoning Ability of Children** of the **Fourth, Fifth** and **Sixth School Grades.** Tests A, B, and D were used and the score for the three tests combined to

make the final score. The possible score has a range from — 29 to --|-- 29.

Below are reproduced the exact directions from Bonser:

Test A. "Numbers 3, 6, and 8, each 3 points; 1, 2, 5, 7, and 9, each — 1; 4 and 10, each — 2."

Test B. "1, 3, 6, 7, and 8, each 2; 2, 4, 5, 9, and 10, each — 2."

Test D. "1, 4, 6, 8, and 10, each 2; 2, 3, 5, 7, and 9, each — 2."

Table III. gives the distribution of the scores according to maturity and sex. It will be noted that the immature of both sexes make the better median score, the median score of the girls being much the better score. In the case of the boys, there is a decided deterioration in the median score from the immature to the maturing, then there is a considerable recovery in the score of the mature boys. This change, if it is really significant, may be the result of various causes among which we may mention the fact that the mature boys are a more selected group than the maturing boys, the poorer ones of the maturing group having possibly dropped out of school.

TABLE III.
Addition Test

Matur'y Score in Sec's	Prepubesc't Boys	Prepubesc't Girls	Pubescent Boys	Pubescent Girls	Postpubesc't Boys	Postpubesc't Girls
*81 85	3					
86 90	1					
91 95	1	1			1	
96 100	1	1	1			
101 105	1	2		1		1
106 110		1	1	2	1	1
111 115		1			1	2
116 120		3			1	
121 125		4	1	1	1	1
126 130	2				2	1
131 135	1	1		1	1	
136 140		1		1	1	3
141 145	5	1			1	
146 150						3
151 155				1	1	2
156 160	4	1	1		2	
161 165				1	1	1
166 170		1	1			
171 175	1	1			2	
176 180						
181 185					1	
186 190						
191 195		1	1	1	1	
196 200	2				4	
201 205			1	1	1	

Matur'y Score in Sec's	Prepubesc't Boys	Prepubesc't Girls	Pubescent Boys	Pubescent Girls	Postpubesc't Boys	Postpubesc't Girls
206 210	1					
211 215					1	
216 220					1	
221 225	2					
226 230						
231 235		1	2			
236 240						
241 245	1					
246 250				1		
251 255	1					
256 260	1			1		
261 265	1					
266 270						
271 275						
276 280			1			
281 285					1	
286 280					1	
291 295	2					
296 300						
301 305						
306 310						
311 315	1					1
316 320						
321 325						
326 330						
331 335	1					
336 340						
341 345						
346 350					1	
Totals	33	21	10	12	28	16
Median score	160.0	123.0	180.5	146.0	169.5	148.0

* 81 85 means 81 to 85.

The lower the score the better the ability tested.

In the case of the girls, there is a slow but steady deterioration in the median score. This decrease may be due to an encroachment of interests other than school work.

The comparison of the various stages of physiological age as a whole given in table III., probably is not as significant as a comparison of the attainments of the younger members with the older members of each group. If it is true, as Crampton has maintained, that early maturity favors good scholarship, then those children in each one of these groups who are younger chronologically and who are therefore advanced in physiological development in comparison with their ages should make a better showing in these tests.

(Table IV. was made with this in mind, the comparison of the younger and older groups of the same physiological age.)

TABLE IV.

Addition Test.

Comparison between younger and older chronological age groups of the same physiological development.

Maturity	Prepubescent		Pubescent		Postpubescent	
	Boys	Girls	Boys	Girls	Boys	Girls
Range of ages, younger groups	10.5 -|- 13.5	11 -|- 12.5	12 -|- 14.5	11.5 -|- 13.5	12.5 -|- 15.0	12.5 -|- 14.5
Number in younger groups	23	6	7	6	20	8
Range of ages of older groups	13.5-|- 16.5	12.5-|- 17.0	14.5-|- 15.5	13.5-|- 16.0	15-|- 19.5	14.5-|- 16.5
Number in older groups	10	15	3	6	8	8
Range in score, younger groups	83 to 332	91 to 169	96 to 280	109 to 205	95 to 281	110 to 152
Range in score, older groups	91 to 253	98 to 232	158 to 232	102 to 250	110 to 349	112 to 312
Med. score, in seconds, younger groups	156.0	117.5	170.0	146.0	167.5	132.5
Med. score, in seconds, older groups	167.0	123.0	201.0	147.0	180.0	144.0

Since the score is figured in seconds, the lower the score, the higher the ability as scored in this test.

Table IV compares different chronological ages of the same physiological development. There is a noticeable difference in the scores of the older and the younger groups of maturing boys, the younger group making the better score, still, there being but seven in the younger group and three in the older group, it would be unsafe to make much of this difference. The younger groups of the boys make a slightly better score than the older groups, which may be said of the older and younger groups of girls. But in the case of the maturing groups of girls the difference in scores is practically zero, in the case of the groups of maturing boys, this is where the greatest difference in scores occurs. There is the same falling off in the score from the immature to the mature in the case of the older groups of both sexes, with a tendency of a minimum in the maturing groups.

Table V. gives the distribution of scores in the "Memory Test," according to the degree of maturity and sex. The immature boys score better than either the maturing or the mature, while the mature girls score the best, but in either case the difference in scores is not great, though this difference may be significant.

TABLE V.
Memory Test

Maturity	Prepubescent		Pubescent		Postpubesc't		Maturity	Prepubescent		Pubescent		Postpubesc't	
	Boys	Girls	Boys	Girls	Boys	Girls		Boys	Girls	Boys	Girls	Boys	Girls
Score							Score						
0	1						16	2				1	
1							17		2		1	3	1
2							18		2			2	2
3							19		1	2		2	
4							20	3	2	2	3	2	2
5							21	5			3	4	1
6					1		22	2		3		4	2
7					1		23	3	3	1	1		2
8							24	4			1	2	1
9							25		2		1	1	1
10							26	2	5				
11				1			27	2	1	1		1	2
12	2	1					28	2	1			2	1
13	1				1		29	2	1		1		
14							30						
15	1		1		1		31						1
							32	1					
							Number of cases	33	21	10	12	28	16
							Median score	22	22	21	21	20.5	22.5

Perfect score 37

Table VI compares different chronological ages of the same physical development, for the purpose of determining the differences in the scores of the older and the younger groups of the same physiological age. There is a decided difference in the scores of the older and the younger groups of boys, the difference being quite pronounced in the case of the mature boys. The scores of the girls exhibit a like variability with a reversal in the immature and mature groups as compared with the boys.

TABLE VI.

Memory Test

Comparison between different chronological ages and the same physiological development.

Maturity	Prepubescent		Pubescent		Postpubescent	
	Boys	Girls	Boys	Girls	Boys	Girls
Range of ages, younger groups	10.5-|-13.5	11-|-12.5	12-|-14.5	11.5-|-13.5	12.5-|-15.0	12.5-|-14.5
Number in younger groups	23	6	7	6	20	8
Range of ages, older groups	13.5-|-16.5	12.5-|-17.0	14.5-|-15.5	13.5-|-16.0	15-|-19.5	14.5-|-16.5
Number in older groups	10	15	3	6	8	8
Range of score, younger groups	0 to 29	18 to 29	19 to 27	11 to 29	13 to 28	17 to 31
Range of score, older groups	12 to 32	12 to 28	15 to 20	17 to 25	7 to 24	18 to 28
Med. score, younger groups	21.1	23.8	22.1	20.7	21.1	22.4
Med. score, older groups	22.1	21.9	18.0	21.3	16.3	23.3
Maximum obtainable individual score	37 ideas	37 ideas	37 ideas	37 ideas	37 ideas	37 ideas
Minimum obtainable individual score	0 ideas	0 ideas	0 ideas	0 ideas	0 ideas	0 ideas

Perfect score 37 ideas.

Table VII gives the distribution by sex and physiological maturity, of the scores in the "Lanes Test." The immature of both sexes make better scores than the more mature, except in the case of the mature boys. There is the same progressive decline in the quality of the scores, which was observed in the two preceding tests. There is the same falling away in excellence, in the maturing stage as was noticed in the other tests, and there is the same partial recovery in the mature group, in the case of the girls, but in the case of the boys the mature group makes the best score. The falling off in the median score of the maturing groups is possibly due to a variety of causes among which might be mentioned unsettled state of interest which is quite noticeable at the time of maturing. The partial recovery in the median score of the mature is due, in the opinion of the writer, to the fact that the more incompetent have dropped out of school, thus leaving a more selected group than would otherwise have been had all remained in school.

TABLE VII.

Lanes Test

Matur'y Score in Sec's	Prepubesc't Boys	Prepubesc't Girls	Pubescent Boys	Pubescent Girls	Postpubesc't Boys	Postpubesc't Girls
*76- 80		1				
81- 85				1		1
86- 90		2				
91- 95		1		1		
96-100		2			1	1
101-105	1	1				
106-110	1	2		1	1	2
111-115	1					
116-120	2	4		1	4	1
121-125	4	2			1	1
126-130	1	1	1	1	1	1
131-135	1	1	2	3		2
136-140		1		1	1	
141-145	1			1	2	1
146-150	2	2	1		3	1
151-155	1			2		1
156-160	2	1			3	1
161-165	5		1		2	
166-170	3				1	
171-175			3		1	

* 76- 80 means 76 to 80

Matur'y Score in Sec's	Prepubesc't Boys	Prepubesc't Girls	Pubescent Boys	Pubescent Girls	Postpubesc't Boys	Postpubesc't Girls
176-180	1				2	
181-185						1
186-190	1					
191-195	4		1		1	
196-200	1				2	
201-205					1	
206-210						
211-215			1			
216-220						
221-225						
226-230						
231-235						
236-240						
241-245						
246-250						1
251-255					1	
256-260						
261-265						
266-270						
271-275						
276-280	1					
281-285						
286-300						
301-305						
306-310						
311-315						
336-340						1
Total number cases	33	21	10	12	28	16
Median score in seconds	160	116	176.5	1325	153.0	134.0

Table VIII compares the different chronological age groups of the same physical development. The scores are distributed on the basis of sex as well as maturity. In the case of the boys, while the scores of the older groups are better than those of the younger groups, except in the case of the mature boys, where the difference is but slight, still there is a gradual decrease in the excellence of the score in the case of the older groups of boys. The younger group of the mature boys scores better than either the two preceding groups. The data of the older groups of girls reveal a lowering of scores in the case of the maturing girls and partial recovery in the mature group.

TABLE VIII.

Lanes Test

Comparison between different chronological ages and the same physiological development.

Maturity	Prepubescent		Pubescent		Postpubescent	
	Boys	Girls	Boys	Girls	Boys	Girls
Range of ages, younger groups	10.5-|-13.5	11-|-12.5	12-|-14.5	11.5-|-13.5	12.5-|-15.0	12.5-|-14.5
Number in younger groups	23	6	7	6	20	8
Range of ages, older groups	13.5-|-16.5	12.5-|-17.0	14.5-|-15.5	13.5-|-16.0	15-|-19.5	14.5-|-16.5
Number in older groups	10	15	3	6	8	8
Range in score, younger groups	103 to 200	88 to 156	127 to 212	94 to 152	99 to 202	84 to 246
Range in score, older groups	107 to 280	78 to 149	147 to 191	82 to 152	119 to 192	98 to 340
Med. score, in sec'ds, younger groups	161.0	128.5	162.0	129.5	152.5	148.5
Med. score, in sec'ds, older group	144.5	116.0	147.0	135.5	153.0	131.0

The lower the score, the higher the ability as scored in this test.

TABLE IX.
Reasoning Test

Matur'y	Prepubesc't Boys	Prepubesc't Girls	Pubescent Boys	Pubescent Girls	Postpubesc't Boys	Postpubesc't Girls	Matur'y	Prepubesc't Boys	Prepubesc't Girls	Pubescent Boys	Pubescent Girls	Postpubesc't Boys	Postpubesc't Girls
—7					1	1	13	3		1		1	
—6	1				1		14		1				
—5							15		1		2		
—4							16					1	3
—3	1						17			1		1	
—2	2						18	1		1			1
—1	1			1	1		19	1	2			2	2
0	1			1			20	2		2		4	2
1		1	1		1		21	1	2	2	1	1	1
2		1					22	1	3		1	3	1
3	1					1	23	6	4		2	1	1
4						1	24	3	3	1			
5					1	1	25	2	1			2	
6	1						26	2				1	1
7					1		27		1			2	
8							28		1		1		
9	1		1	1	1								
10	1												
11				1	1								
12	1			1	1								
					Total number of cases			33	21	10	12	28	16
					Median score			20.0	22.0	19.0	15.0	19.5	17.5

Possible range of score, — 29 to + 29.

Table IX gives the distribution of the scores in the "Reasoning Test," according sex and maturity. The median immature boy is poorer than the median immature girl, and is slightly better than either the median maturing boy or the median mature boy. There is a marked decrease in the median score of the mature group of girls as compared with that of the immature group of girls.

Table X compares different chronological age groups of the same physical development. The scores are distributed, also according to sex, that a comparison may be made on that basis. In every case, the younger groups make the better median scores. The older groups of both the boys and the girls show a gradual decrease in the excellence of the score, with a marked lowering in the maturing groups, which is followed by a partial recovery in the mature groups. This recovery might be due to the mature group being a more selected one, or further, this mature group has adapted itself to the routine of the school, and does just about so well in whatever it attempts to do, while the maturing group is in the stress of adjusting itself to changing conditions both physical and mental.

TABLE X.

Reasoning Test

Comparison between different chronological ages and the same physiological development.

Maturity	Prepubescent		Pubescent		Postpubescent	
	Boys	Girls	Boys	Girls	Boys	Girls
Range of ages, younger groups	10.5 -|- 13.5	11 -|- 12.5	12 -|- 14.5	11.5-|- 13.5	12.5 -|- 15.0	12.5 -|- 14.5
Range of ages, older groups	13.5 -|- 16.5	12.5 -|- 17.0	14.5 15.5	13.5 -|- 16.0	15 -|- 19.5	14.5 -|- 16.5
Number in younger groups	23	6	7	6	20	8
Number in older groups	10	15	3	6	8	8
Range of score, younger groups	—6 to 26	-|- 2 to 28	-|- 9 to 24	—1 to 23	— 7 to 27	-|-3 to 23
Range of score, older groups	— 2 to 26	0 to 27	-|- 1 to 18	0 to 28	— 6 to 25	—7 to 26
Med. score, younger groups	20.0	23.0	21	18.0	20.0	20.0
Med. score, older group	18.0	21.0	13.0	13.5	15.0	15.0
Maximum obtainable individual score	29	29	29	29	29	29
Minimum obtainable individual score	— 29	— 29	— 29	— 29	— 29	— 29

Tables XI to XIV inclusive were compiled for the purpose of determining the possible influence of chronological age in the scores in these tests. It will be noted that in none of these tests did the younger group of girls fall below the median score of the older group of girls. By older and younger in this part of the discussion is meant chronologically older or younger. The score of the older group of boys exceeds that of the younger group of boys in the "Addition" and the "Lanes Tests." This is true throughout for the "Lanes Test." This would seem to imply that the chronologically older are better in simple muscular control than are the chronologically younger.

TABLE XI.

Addition Test

Comparison between different chronological ages and physiological development, by sex.

	Boys	Girls
Range of ages, younger groups	10.5 -|- — 13.5	11 -|- — 13.5
Number in younger groups	30	25
Range of score, in seconds, younger groups	83 to 332	91 to 257
Range of score, in seconds, older groups	91 to 349	101 to 312
Number in older groups	41	24
Range of ages, older groups	13.5 -|- — 19.5	13.5 -|- — 17.0
Med. score in seconds, younger groups	160.0	123.0
Med. score in seconds, older groups	155.0	146.5

The lower the score, the higher the ability as rated by the method of scoring.

TABLE XII.

Memory Test

Comparison between different chronological ages and physiological development, by sex.

	Boys	Girls
Range of ages, younger groups	10.5 -|- — 13.5	11 -|- — 13.5
Younger groups, number of	30	25
Range of score, younger groups	0 to 29	11 to 31
Range of score, older groups	7 to 32	12 to 28
Number in older groups	41	24
Range of ages, older groups	13.5 -|- — 19.5	13.5 -|- — 17.0
Median score, younger groups	22.0	22.0
Median score, older groups	20.0	22.0
Maximum obtainable individual score	37 ideas	37 ideas
Minimum obtainable individual score	0 ideas	0 ideas

TABLE XIII.

Lanes Test

Comparison between different chronological ages and physiological development, by sex.

	Boys	Girls
Range of ages, younger groups	10.5 -|- — 13.5	11-|- — 13.5
Number in younger groups	30	25
Range of score in seconds, younger groups	114 to 198	84 to 246
Range of score in seconds, older groups	99 to 280	78 to 340
Number in older groups	41	24
Range of ages, older groups	13.5 -|- — 19.5	13.5 -|- — 17.0
Med. score, in seconds, younger groups	161.5	116.0
Med. score, in seconds, older groups	150.0	132.5

The lower the score, the higher the ability as rated by the method of scoring.

TABLE XIV.

Reasoning Test

Comparison between different chronological ages and physiological development, by sex.

	Boys	Girls
Range of ages, younger groups	10.5 -|- — 13.5	11 -|- — 13.5
Number in younger groups	30	25
Range of score, younger groups	— 6 to -|- 26	— 1 to -|- 28
Range of score, older groups	— 6 to -|- 27	— 7 to -|- 28
Number in older groups	41	24
Range of ages, older groups	13.5 -|- —19.5	13.5 -|- — 17.0
Median score, younger groups	20.0	20.0
Median score, older groups	19.0	15.0
Maximum obtainable individual score	-|- 29	-|- 29
Minimum obtainable individual score	— 29	— 29

Comparison of School Grades With Chronological and Physical Age.

Table XV gives the distribution of "Good" and "Poor" grades according to chronological age and sex. It will be noticed that the group represented by the chronological ages 12.5 years to 13.0 years makes slightly more good grades, both boys and girls, than any other group, and of this group the girls do much better than the boys. For an explanation of the meaning of **Good** and **Poor** grades see note to Table XVI.

Table XVI gives the distribution of school grades on the basis of maturity, chronological age and sex. The most striking feature of this table is superiority of the younger group of mature girls over the older group of mature girls.

Table XVII is a distribution of school grades on the basis of chronological age and sex. Here the younger groups of both sexes are the better, the girls being much better than the boys.

TABLE XV.

Distribution of "Good" and "Poor" grades according to chronological age and sex.

Years	No. of Cases Boys	Boys Good	Boys Poor	Girls Good	Girls Poor	No. of Cases Girls
10.5 -|- — 11.0	1	4	3			
11 -|- — 11.5	3	2	16	5	1	1
11.5 -|- — 12.0	3	11	7	1	5	1
12 -|- — 12.5	4	8	16	29	4	6
12.5 -|- — 13.0	10	26	28	23	6	5
13 -|- — 13.5	9	11	36	41	26	12
13.5 -|- — 14.0	14	23	53	9	20	5
14 -|- — 14.5	7	5	32	22	12	6
14.5 -|- — 15.0	9	12	37	6	12	4
15 -|- — 15.5	5	12	14	3	17	5
15.5 -|- — 16.0	2	5	5	0	10	2
16 -|- — 16.5	2	3	8	1	3	1
16.5 -|- — 17.0				1	3	1
17 -|- — 17.5						
17.5 -|- — 18.0						
18 -|- — 18.5	1	0	4			
18.5 -|- — 19.0						
19. -|- — 19.5	1	0	5			
No. of Cases	71					49

TABLE XVI.

School Grades

Comparison between different chronological ages of the same physiological development.

Maturity	Prepubescent		Pubescent		Postpubescent	
	Boys	Girls	Boys	Girls	Boys	Girls
Range of ages, younger groups	10.5 -|- 13.5	11 -|- 12.5	12 -|- 14.5	11.5 -|- 13.5	12.5 -|- 15.0	12.5 -|- 14.5
Number in younger groups	23	18	7	6	20	8
Younger groups, No. of "Good" grades	43	75	18	13	22	28
Younger groups, No. of "Poor" grades	87	26	20	20	83	19
Older groups, No. of "Good" grades	19	2	6	14	14	9
Older groups, No. of "Poor" grades	38	13	10	18	28	25
Number of cases, older groups	10	3	3	6	8	8
Range of ages, older groups	13.5 -|- 16.5	12.5 -|- 17.0	14.5 -|- 15.5	13.5 -|- 16.0	15 -|- 19.5	14.5 -|- 16.5
Av. No. of "Good" grades per pupil, younger groups	1.9	4.2	2.6	2.2	1.1	3.5
Av. No. of "Good" grades per pupil, older groups	1.9	.7	2.0	1.3	1.8	1.1
Av. No. of "Poor" grades per pupil, younger groups	3.7	1.4	2.9	3.3	4.2	2.4
Av. No. of "Poor" grades per pupil, older groups	3.8	4.3	3.3	3.0	3.5	3.1

NOTE:—School grades were given in the following letters, beginning with the letter denoting the highest grade: E, G, M, P, and F. For the purpose of this study, E and G were taken as "Good Grade," and M, P, and F as "Poor Grade."

TABLE XVII.

Comparison between different chronological ages and physiological development, by sex.

	Boys	Girls
Range of ages, younger groups	10.5 — 13.5	11 -|- — 13.5
Number in younger groups	30	25
Younger groups, No. of "Good" grades	62	99
Younger groups, No. of "Poor" grades	106	42
Older groups, No. of "Good" grades	60	42
Older groups, No. of "Poor" grades	158	77
Number in older groups	41	24
Range of ages, older groups	13.5 -|- — 19.5	13.5 -|- — 17.0
No. of "Good" grades per pupil, younger groups	2.1	3.9
No. of "Good" grades per pupil, older groups	1.5	1.8
No. of "Poor" grades per pupil, younger groups	3.5	1.7
No. of "Poor" grades per pupil, older groups	3.9	3.2

V. The Burlington and Sheldon Material.

To supplement the preceding section the following is added based on estimates of degree of maturity gathered in Burlington and Sheldon, Iowa.

These data were gathered in the Burlington high school, the 9th grade class, and the Sheldon schools in the 7th, 8th, 9th, and 10th grades, under the directions of Doctor King, of the State University of Iowa. Doctor King prepared the blanks, as well as giving method of determining physiological age.

The determination of maturity in both cases was only by estimate based on the appearance of the individual as to his degree of maturity. In this stature and figure were the most important elements. Hence it is not as accurate as the corresponding records from Iowa City.

The original intention in gethering these data, was to get a continuous record of the same individual, through a series of years in order to trace, if possible, the effect of different rates of development.

This material lends itself to our problem in giving school grades made by children of different degrees of maturity (estimated.) Since there were two, and in some cases, three reports on the same individual, it has the effect of increasing the total data rather materially.

The following tables, XVIII. to XXV., inclusive, are worked out on the same plan as the preceding ones for the Iowa City material and may be compared directly with them.

TABLE XVIII.
Sheldon, Iowa
Age Distribution

Years	Prepubescent Boys	Prepubescent Girls	Puhescent Boys	Puhescent Girls	Postpuhescent Boys	Postpuhescent Girls
11 -|- — 11.5		1			3 in 1st Report	
11.5 -|- — 12.0		2		1		
12 -|- — 12.5	2	5 — /*	1	1		
12.5 -|- — 13.0	2	6		1 1		
13 -|- — 13.5	2 — /	3	1 1	3 2 — /		2 1
13.5 -|- — 14.0	4	4 1	1 1	7 2 — /		1
14 -|- — 14.5	1	1 2 — /	6 — /	6 4	4	1 3 3
14.5 -|- — 15.0			5	1 7 1 — /	1 2	3 5 — / 4
15 -|- — 15.5	1	1 1	2	2 1	4 — /6	4 5 7
15.5 -|- — 16.0		1	2	6 1	6 /4 — /	4 — / /10
16 -|- — 16.5			1 1	1	— 3 6	— 7 11
16.5 -|- — 17.0			1	1	1 4	1 2 4
17 -|- — 17.5					1 3	1 3 3
17.5 -|- — 18.0			1	1	1	1 2 2
18 -|- — 18.5						1
18.5 -|- — 19.0						2
19. -|- — 19.5						1

* / represents an arrow.

NOTE:—The numbers in the corners of the squares show the frequencies for the three reports included in this table. The table is read as follows: Begin with the upper left hand corner of the square and read to the right, thus, the upper left hand corners will contain the number found in the first report, the upper right hand corners, the number in the second report, the lower right hand corners, the number in the third report.

The underlined number mark the divisions between the older and younger groups.

TABLE XIX.

Sheldon, Iowa

Comparison between different chronological ages of the same physiological development.

FIRST REPORT.

Median school grade in per cent (100 per cent base.)

Maturity.....	Prepubescent		Pubescent		Postpubescent	
	Boys	Girls	Boys	Girls	Boys	Girls
Range of ages, younger groups	12 -|- 13.5	11 -|- 12.5	12 -|- 14.5	12.5 -|- 14.0	There were but 3 boys in this group	13 -|- 15.0
Number of cases, younger groups	6	8	9	11		6
Younger groups, Median school grade	87.0	89.5	87.0	86.0		84.0
Older group, Median school grade	84.5	87.0	85.0	87.0		84.0
Range of ages, older groups	13.5 -|- 15.5	12.5 -|- 15.5	14.5 -|- 18.0	14 -|- 18.0		15 -|- 18.0
Number of cases, older groups	6	15	12	22		7

TABLE XX.

SECOND REPORT.

Maturity	Prepubescent		Pubescent		Postpubescent	
	Boys	Girls	Boys	Girls	Boys	Girls
Range of ages, younger groups	This item too small for distribution	13.5 -|- 14.5	13 -|- 15.0	11.5 -|- 13.5	14 -|- 15.5	14 -|- 16.0
Number of cases, younger groups		3	3	5	9	17
Younger groups, Median grade		80.0	82.0	95.0	83.0	86.0
Older groups, Median grade		87.5	85.0	85.0	79.0	89.0
Range of ages, older groups		15 -|- 16.0	15 -|- 16.5	13.5 16.0	15.5 -|- 17.5	16 -|- 18.5
Number of cases, older groups		2	3	9	11	15

TABLE XXI.

Sheldon, Iowa

THIRD REPORT.

Maturity		Postpubescent	
		Boys	Girls
Range of ages, younger groups	First two items omitted because of smallness of each	14.5 -|- 16.0	13 -|- 16.0
Number of cases, younger groups		12	26
Younger groups, median grade		80.0	85.5
Older groups, median grade		85.0	86.0
Range of ages, older groups		16 -|- 18.0	16 -|- 19.5
Number of cases, older groups		14	23

TABLE XXII.

Burlington, Iowa

High School

Maturity ..... / Sex	Prepubescent Boys	Prepubescent Girls	Pubescent Boys	Pubescent Girls	Postpubescent Boys	Postpubescent Girls
Years 12.5 -|- — 13.0				2		
13 -|- — 13.5	4	1		1		
13.5 -|- — 14.0		4 —	2	10 1		
14 -|- — 14.5	10 2 —	3	1	18 3 —		1 (73)
14.5 -|- — 15.0	6 2 —	2	2 1	11 15 —		1
15 -|- — 15.5	2 3	2	6 9 — — 1	7 16		(84) 1 2
15.5 -|- — 16.0		3	2 5 2	7 8 (81,78) 2	2	(76) 1 8
16 -|- — 16.5	1		4 5 7	7 (90) 1	1	2 (86) 1 (97) (95) 16
16.5 -|- — 17.0			2 — 1 5	8	2	— 1 (78) 14
17 -|- — 17.5			3 2	(82) 1	— 3	(96,86) 2 4
17.5 -|- — 18.0			1		2 (73) (79) 1	(78) 1 8
18 -|- — 18.5			1		1	2

NOTE:—This table is read the same as the corresponding table of the Sheldon report with this addition, the numbers bracketed next to the figures in the corners give the average grade of those corresponding to the corner numbers.

TABLE XXIII.

Burlington, Iowa

High School

Comparison between different chronological ages of the same physiological development.

FIRST REPORT.

Median school grade in per cent (100 per cent base.)

Maturity	Prepubescent		Pubescent		Postpubescent	
	Boys	Girls	Boys	Girls	Boys	Girls
Range of ages, younger groups	13 -|- 14.5	13 -|- 14.0	13.5 -|- 15.5	12.5 -|- 14.5		
Number of cases, younger groups	14	5	10	31		
Younger groups, Median grade	86.5	84.0	80.5	87.0		
Older groups, Median grade	76.0	80.5	82.5	84.0		
Range of ages, older groups	14.5 -|- 16.5	14 -|- 16.0	15.5 -|- 17.0	14.5 -|- 16.0		
Number of cases, older groups	9	10	8	25		

TABLE XXIV.

Burlington High School

SECOND REPORT.

Maturity	Prepubescent		Pubescent		Postpubescent	
	Boys	Girls	Boys	Girls	Boys	Girls
Range of ages, younger groups	14 -|- 15.0		14 -|- 15.5	13.5 -|- 15.0		
Number of cases, younger groups	4		11	19		
Younger groups, Median grade	89.5		86.0	87.0		
Older groups, Median grade	83.0		83.0	84.0		
Range of ages, older groups	15 -|- 15.5		15.5 -|- 18.0	15 -|- 17.0		
Numbers of cases, older gronps	3		15	39		

TABLE XXV.

Burlington High School

THIRD REPORT.

Maturity	Prepubescent		Pubescent		Postpubescent	
	Boys	Girls	Boys	Girls	Boys	Girls
Range of ages, younger groups			15 -|- 16.5		15.5 -|- 17.0	14.5 -|- 16.5
Number of cases, younger groups			10		5	27
Younger groups, Median school grade			86.0		80.0	85.0
Older groups, Median school grade			80.0		79.0	84.0
Range of ages, older groups			16.5 -|- 18.5		17.0 -|- 18.5	16.5 -|- 18.5
Number of cases, older groups			8		5	28

The conclusions that can be drawn from a study of these tables are not many, but it seems that these two stand out: The younger groups do slightly better than the older groups, and that there is not much difference in the way boys and girls do the work of the school. That is if one judges by the grades each receive.

The first report shows that there were but three boys in the mature groups, which seems to emphasize the statement that the more mature boys will not as a rule stay in school longer than they can get a "job."

VI. General Conclusions.

For conclusions regarding the individual tests, the reader is referred to the specific discussions in connection with the several tables. The following conclusions refer to the study as a whole:

1. In so far as physiological age is concerned in influencing mental ability, there is in our data no striking evidnece of difference in ability due to this sole factor of physiological age. These tests and the study of the school grades bear out this statement.

2. If we take each physiological age group and compare those who are advanced or somewhat accelerated in their physiological development with those who are relatively retarded, we find differences standing out, although, here again these differences are not striking. The weight of evidence seems to be slightly in favor of those who have developed earlier. This appears to accord with the hypothesis of Crampton and Boas, that earlier physiological development is favorable to scholarship. This conclusion seems also to be supported by the data from the schools of Burlington and Sheldon.

3. On the whole, the girls do better than the boys, but the difference is not great, though it is clearly present.

4. The younger groups, that is those who are younger chronologically, irrespective of physiological age, do better than the older groups. Hence there seem to be grounds for assuming that the school does better by the younger than by the older pupils.

The findings of this study, while apparently somewhat different from those of Crampton and Boas, should not be taken as conclusive evidence that the findings of these two gentlemen are erroneous. The writer is inclined to believe that the conditions which determine mental efficiency are very complex and that no study of any one of these conditions will be apt to show a high correlation with school ability or ability in mental tests.

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